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ABSTRACT

This study determined the effects of two data collection techniques on response rate, response bias, response validity and respondent evaluation. Administration of a computer survey was compared to a machine readable paper survey. Cover letters were sent to 249 college sophomores who were randomly selected and proportionally stratified by intended major. They were alternately assigned either a computer-assisted survey or an optically-scanned paper and pencil survey. Both questionnaires contained 31 identical items. After eliminating four nondeliverable surveys, the response rate was 29 percent for the computer-group and 49 percent for the scanner-group. There was no difference in response rates between applied and non-applied majors. Significantly more computer-group members had had previous computer experience. There was no difference in overall satisfaction means between groups. Students in the scanner-group were more likely to overestimate their actual grade point average. In evaluating the survey, both groups considered the survey convenient. Computer-group members were more likely to recommend it to a friend and felt that the survey was too short. From this study it is concluded that the practical and psychological advantages of administering an attitude survey by computer outweigh the disadvantages associated with its lower response rate. (Author/PN)

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SURVEY ADMINISTRATION: COMPUTER-BASED VS. MACHINE READABLE

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ABSTRACT

The purpose of this study was to determine the effect of a computer-assisted survey on response rate, response bias, response validity, and respondent evaluation. A literature review revealed that little empirical evidence exists comparing computer-assisted surveys to other modes of survey administration. Empirical evidence indicates that automated survey administration is both feasible and valid. Respondents tend to give more varied responses, respond at about the same rate as in other noncomputer surveys, and have at least as favorable an opinion toward computer surveys as noncomputer surveys. Cover letters were sent to 249 sophomores who were randomly selected and proportionally stratified by intended major. They were alternately assigned to receive either a computer-assisted survey or an optically-scanned paper and pencil survey. Both questionnaires contained 31 identical items. After eliminating four nondeliverable surveys, the response rate was 29% for the computer-group and 49% for the scanner-group. The difference was statistically significant ($p = .001$, one-tailed test). There was no difference in response rates between applied and nonapplied majors ($p > .60$). Significantly more computer group members had had previous computer experience ($p = .04$). There was no difference in overall satisfaction means between groups ($p > .70$) or in providing valid student identification numbers ($p > .30$). However, students in the scanner-group were more likely to overestimate their actual GPA ($p < .001$), while computer-group members disagreed with University records regarding their initial entry date ($p < .001$). In evaluating the survey, both groups considered the survey convenient ($p > .18$). Computer-group members were more likely to recommend it to a friend ($p = .05$) and felt the survey was too short ($p < .001$). From this study it is concluded that the practical and psychological advantages of administering an attitude survey by computer outweigh the disadvantages associated with its lower response rate.

Survey Administration: Computer-Based Vs. Machine Readable
Session No. 46.11
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Reliance on survey techniques for data collection remains a mainstay of higher education in its struggle against declining enrollments and diminishing resources. Students themselves are an excellent source of knowledge for not only evaluating services but assessing their various levels of academic and social integration. Sophisticated computer techniques for collecting data that are immediately accessible for analysis have only recently been developed in the area of survey research. Relatively more common to the field of evaluation is the use of mark-sense readers. These readers are a class of electronic devices that convert marks made on a paper sheet to electronic information by means of either electrical or optical sensing of the marks. The paper sheets are often referred to as scanner sheets. Only in the last ten years have mark-sense readers been used to collect data from surveys and polls. Powell (1984) reports that the advantage of using scanner surveys for data collection is the speed with which the data is made available for analysis. He found that it took about ten hours to read 2,000 surveys through a mark-sense reader onto a microcomputer data base. What has been lacking, however, is empirical evidence comparing various nontraditional methods of survey administration.

The purpose of this study was to determine the effects of two data collection techniques on response rate, response bias, response validity, and respondent evaluation. Administration of a computer survey was compared to an machine readable paper survey. The study was designed after a review of pertinent literature revealed literally no information comparing these two nontraditional survey instruments.

From an extensive literature search, only three studies were identified that compared a computer-assisted survey to any other method of survey delivery. Of the three, the one that most closely approximates the intent of the current study compared computer-based intelligence testing with a traditional paper and pencil administration (Hedl, 1971). Validity evaluation of the computer-based approach resulted in a high correlation (r = .75, p = < .01). between the computer-based Slosson Intelligence Test and the original form, and confirmed that an automated administration of the test is both feasible and valid. One of the limitations affecting the internal validity of this I.Q. experiment was testing effects. That is, since the same group was tested twice, one week apart, memory cannot be discounted as a confounding influence. It is not unusual on achievement and intelligence tests for students to perform as much as three to five I.Q. points higher on the average (Campbell and Stanley, 1963). Nevertheless, the advantage of the approach used in the I.Q. study is that the entire diagnostic evaluation occurs within a terminal-oriented interaction between the student and the computer system. The investigator claims that the increase in I.Q. from one test to the other is partially a factor of the stimulus characteristics of the computer-based I.Q. item presentation. Items are presented visually and remain on the screen until a student responds to each item. This may have maximized practice effects.

Another study, similar in administration to the current experiment, compared a computer-assisted questionnaire with a conventional field interview in investigating the bathing habits of women (O'Brien and Dugdale, 1978). This marketing research experiment compared results for two matched samples of 126 females each who had been subjected to either a computer or an orally-administered questionnaire. The investigators concluded that the computer can elicit data which is broadly similar to that obtained from a conventional oral administration. While data between groups was not statistically significant,

there was discovered a marginal, but fairly consistent tendency for mean response values to be nearer to what may be considered as the "honest" end of each scale for the computer derived data. Moreover, the computer appears to have stimulated a slightly greater use of the extremes of each scale. Thus, there may be a greater tendency to be honest with a machine with a preprogrammed personality and to use more extreme values of a scale when responding to a computer. The authors suggest that these tendencies are a result of respondent interest and motivation to respond in a thoughtful way, as well as respondents being less embarassed by the computer, and therefore slightly more inclined to be honest with it. It is argued that savings accrued from this method offset the capital outlay for the computer. This is especially true in terms of interviewers time, the ability to investigate a large and heterogeneous sample, automatic editing by the computer and lack of needing to key punch data.

A third study that resembles the approach of the current one emphasizes the importance of objectively assessing the attitudes of patients toward medical interviews conducted by computer versus those done by a doctor (Lucas, 1977). After 75 outpatients were interrogated about their medical history by computer, they were given a questionnaire to take home. A response rate of 89% was achieved. Three concepts were included in the questionnaire that were intended to assess patients' attitudes toward medical interviews with a doctor, medical interviews with a computer, and the ideal medical interview. Psychological attitude scaling techniques were used which proved to be reliable and valid measures of patient attitude toward computer interrogation. While the attitude scales revealed that 82% of the respondents had favorable attitudes toward computer interrogation, about half of the patients had more favorable attitudes toward medical interviews with a computer than toward medical interviews with a doctor. This implies that the overall level of satisfaction with its medical

care for this sample of patients would have been the same regardless of which of the two types of interrogation it received.

Other studies conducted which were tangential to the intent of the current experiment included a comparison of a traditional paper and pencil survey on job satisfaction with one that included the same survey with a computerized answer sheet (Feild, Holley, and Armenakis, 1978). Of 170 employees who were given either of the two types of surveys, results based on a 54% response rate indicated that there was no significant difference between the two formats for either expressed job satisfaction or response rates.

Finally, Hessedenz and Smith (1977) found that response rates could not be improved regardless of whether a traditionally typed questionnaire was used or a personalized computer-printed survey.

Although no empirical evidence was discovered that dealt specifically with a comparison of a computer survey with a machine readable survey, those studies reviewed advocated computers as a viable means of survey administration. To investigate the role of computer-assisted survey administration, four research questions are addressed in this study: (1) Is there a response rate advantage between the two methods of delivery? (2) Do either of the two methods cause response bias? (3) Is either method more valid than the other? and (4) Do respondents evaluate this survey more favorably in one group than the other?

Method.

Subjects.

A total of 249 sophomores who had participated in a national study of 1984 freshmen (N = 795) were randomly selected and proportionally stratified by intended major. There were 137 selected who had chosen applied fields such as computer science or business while 112 chose nonapplied fields such as philosophy or English. With students thus separated, they were alternately assigned either to a group destined for the computer assisted survey (i.e., computer-group) or a group that was to complete an optically-scanned questionnaire (i.e., scanner- group). Thus, there were 125 students in the computer group and 124 students in the scanner group.

The initial mailing occured during mid-November. The study continued through the first week of December. After announcing the survey in the campus newspaper, offerring multiple incentives, conducting two follow-up mailings, and a telephone call to computer-group nonrespondents as well as one follow-up mailing to the scanner-group, 96 students responded to the study (See Appendix for student contact information). After four nondeliverable surveys were deleted from the sample, the overall response rate was 39%. The respondent population included 36 students in the computer group and 60 students in the scanner-group. Response rates for the computer and scanner group were 29% and 49%, respectively.

Because of the technical nature of the computer survey, it was expected that a disproportionate number of students with applied majors would elect to complete the computer survey. To assist in controlling for the potentially contaminating factor of major, students from both the applied and nonapplied areas were evenly distributed between the computer and scanner groups. Both groups were then compared for response bias related to intended major.

Apparatus and Materials.

Two identical surveys of 31 questions each were administered using separate delivery mechanisms. All but four of the survey items were extracted from an ongoing student retention study. These four questions were designed to assess the instrument itself.

Scanner Survey.

The scanner survey was administered using a one page, custom-designed universal survey form developed by National Computer Systems and designed by the investigators. It was to be completed in pencil and scored by a Sentry 70 Mark Sense Optical-Scanner. An inhouse printer was used to print the corresponding questions onto the form. Scannable information in the upper left corner was used to link pertinent identifying information of the person filling out the form (i.e., Student Identification Number) with university records. As to survey content, all questions were derived from an on-going student retention study. Six background questions were asked which were verifiable through University records. Approximately five minutes were needed to complete the survey.

Besides the scanner form, a cover letter was included that explained the purpose of the survey, stressed confidentiality of responses, offered the incentives of free refreshments and a chance at two $25 cash awards, as well as included instructions on where to deposit the completed survey. Each envelope contained a No. 2 pencil to assist students in completing the survey. A follow-up letter was sent two weeks after the initial survey. It reemphasized the need for completion, stressed incentives, and included another pencil.

Computer Survey.

The computer survey was administered using Digital's Authoring Language (DAL) software. This courseware authoring tool allows the user to take a structured approach in the development of instructional applications. Each of

the survey questions constituted a separate routine or unit and were presented one at a time. Within each unit, screen handling is done; the question is asked; responses are tested and data are prepared for output. Questions identical in form and content to the scanner survey were asked using DAL. In terms of question sequence, students were not asked to provide pertinent identifying information (i.e., student identification number) until last. This was done to allow students the opportunity to observe questions prior to supplying potentially sensitive information. As in the scanner group, students were sent an initial cover letter. It stressed the hours that the computer would be available, the location, the fact that a consultant would be available to assist them, and how to contact the study coordinator for inquiries related to the experiment. Two other follow-up letters were also sent. The first was forwarded four days into the study and stated that the computer station had been relocated closer to the student mail boxes and operating hours had been extended. The final cover letter was sent two weeks into the study, simultaneous with that of the scanner group follow-up. In addition, the software itself restated the purpose of the survey and stressed that confidentiality would be maintained.

Two Digital VT240 terminals set up at the same location were used as input devices. All students had to do was press the "Y" key, the "N" key, or a number from zero to nine. The program would automatically record the response and "roll over" to the next question. Student responses were automatically read to a file on the University's VAX 11/785 academic computer. Since identical questions were used on both the computer and scanner surveys, the same six background items for the computer group were also verified. Approximately two minutes were needed to complete the computer survey.

Procedures.

After 249 sophomores had been randomly selected and proportionally stratified either by an applied or nonapplied intended major, they were alternately assigned to an experimental (i.e., computer) or control (i.e., scanner) group of approximately 125 persons each. The computer group received a series of cover letters in their campus mail box asking them to locate a nearby computer station and complete the **Student Opinion Survey**.

Simultaneous to the delivery of cover letters for the computer group, the scanner group received an initial and follow-up cover letter (two weeks apart) in their campus mailbox asking them to complete an accompanying optically-scannable, two-sided **Student Opinion Survey** which was identical in content to the one designed for the computer group. Both mailings to the scanner group included a No. 2 pencil. In both the computer and scanner groups, students were excluded from the study if the postal service had returned materials marked "not forwardable." Four surveys were thus returned, two from each group.

Checks were made for response rate, response bias, response validity, and respondent evaluation. After response rate comparisons were made, response bias between the two methods of survey delivery was checked by assessing three factors: major, prior computer experience, and expressed attitude. Response validity was assessed by verifying seven background items with University records. Theses included student identification number (SID), race, sex, full-time status, initial entry date, campus residency, and freshmen grade-point-average (GPA). The relationship between the student's assessment of these background variables with University records was treated as a measure of concurrent validity, with the University records being treated as the external criterion. For example, a high self-reported GPA from either group should be associated with a high GPA as recorded on University records and vice versa. Evaluative items were placed at the end of each survey. These three questions

solicited student assessment of (1) the convenience of taking the survey, (2) whether they would recommend the survey to a friend and (3) what they thought about survey length.

Results.

Response Rates.

The response rate for the computer group was 29% while that of the scanner group was 49%. This difference is significant for a one-tailed test ($z = -3.31$, $p < .001$). Table 1 shows the response rates of the two response formats by the demographic variables of race, sex, GPA, status, residency and initial entry date. That no significant differences were found suggests that the students who participated in the study, in terms of response format, did not differ on major demographic variables.

Response Bias.

Three checks were made for response bias and are illustrated in Figure 1. First, undergraduate major was treated as a source of response bias. Since it was expected that applied majors might be more likely than nonapplied majors to complete an interactive survey instrument (such as a computer survey), they were assigned alternately to either the experimental or control group. This strategy apparently was successful since there were no statistically significant response rate differences between applied and nonapplied majors ($x^2_1 = 0.23$, $C =$

Second, prior computer experience was treated as another source of response bias. This question was asked toward the end of the survey and was intended to assess whether or not those with previous computer experience might be more likely to respond to a particular method of survey delivery. In this sense, the question served as a follow-up to the one regarding major. Since data for intended major had been taken from a national study of precollege characteristics of the current survey population, and was over a year old, it was expected that students may have subsequently changed major. Asking about prior computer experience proved significant since 92% of the computer group and 75% of the scanner-group indicated that they had had previous computer experience ($x^2_1 =$

4.10, C = .20, p = .04). Further investigation revealed that groups did not differ when contrasting prior computer experience with intended major (x^2_1 = 0.81, C = .07, p > .60).

A third check for response bias was conducted comparing both methods of survey delivery since it was hypothesized that the format and administration of an attitude questionnaire could conceivably affect an expressed attitude (Campbell & Stanley, 1963). The question related to student satisfaction with their overall experience at UNCW was used for analysis. The expectation was that since students were randomly selected to receive one of the two response formats, data would have similar means regardless of the format used. A one-way analysis of variance was calculated between the two methods to test the hypothesis and proved to be nonsignificant at the .05 level, F (1, 95) = 0.13, P > .70. While investigating the means related to student satisfaction, it was discovered that the computer group produced a response distribution for all of the opinion items that had a higher standard deviation than the scanner group distribution. This is an indication that, with the computer, respondents are slighly less likely to opt for the middle categories of the scales (see Appendix for Student Opinion Survey results).

Response Validity.

As previously stated, seven background questions were asked which could be verified by University records. A greater percentage (8%) of the scanner group omitted their SIDs than did the computer group (3%). However, this difference was not statistically significant for a one-tailed test (z = 1.0, p > .30).

Table 2 describes that when matching student responses with the University records for the other six variables, only two statistically significant discrepancies were noted. These related to initial entry date to the University and freshman GPA. Further investigation revealed that those in the computer group were more likely than those in the scanner group to disagree with

University records that fall 1984 was their first semester at UNCW ($T = -4.18$, $p < .001$).

Within the two methods of survey administration, scanner group members were more likely to overestimate their GPA than were computer group members ($T = 4.79$, $p < .001$).

Respondent Evaluation.

As a further comparison of the two modes of survey delivery, students in each group were asked three evaluative questions related to convenience of the survey, likelihood of recommending the survey to a friend, and survey length. Most respondents (83%) said their survey was not inconvenient, would recommend the survey to a friend (90%), and thought the survey length was about right (59%).

In terms of convenience of the survey, there was no difference between the two groups' evaluations ($\chi^2_1 = 3.3$, $C = .18$, $p > .18$).

Those most likely to recommend the survey to a friend came from the computer group. All but one individual replied affirmatively. This positive response from 97% of the computer group members was significantly different from the 85% positive rating in the scanner group ($\chi^2_1 = 3.69$, $C = .19$, $p = .05$).

Concerning survey length an equal percentage (86%) from both groups claimed it was either too short or about right. Those in the computer group felt it was too short, while those in the scanner group felt is was about the right length. This difference is significant ($\chi^2_1 = 60.60$, $C = .62$, $p < .001$). Figure 2 further describes these findings.

Discussion.

In this study, computer respondents gave more varied responses, responded at a lower rate, and reacted more favorably toward the survey instrument than did noncomputer respondents. Mindful that a larger sample might have

strengthened the statistical analyses and that the immediacy of the respondent evaluation might have created a reactive effect, a number of conclusions can be drawn from this study. First, students' naivete about computers cannot be assumed. That almost all of those responding to the computer survey had had prior experience with computers is consistent with suspicions about who would likely respond. The attempt to control, a priori, for this experience factor by dichotomizing majors into applied and nonapplied fields based on the assumption that applied majors might be more computer oriented than nonapplied major proved risky. That is, assessing response bias based on major alone would have lead to the faulty conclusion that because majors did not differ in response rates there would be no experience differential in completing the computer survey. However, there was a difference in response rates. But rather than being associated with major, it was significantly related to prior computer experience ($\underline{x}^2_1 = 4.10$, $\underline{C} = .20$, $\underline{p} = .04$). While 92% of the computer group claimed to have had previous computer explosure, only 75% of the scanner group reported the same. This compared to a finding of no difference for the 84% of applied majors and 78% of nonapplied majors who claimed to have had previous computer experience ($\underline{x}^2_1 = 0.18$, $\underline{C} = .07$, $\underline{p} > .60$). Thus, prior experience alone, irrespective of intended major, may be a key factor in determining who would likely respond to a computer survey.

Second, experimenters need to go beyond merely checking for mean differences between opinion items when considering the effect of format and administration on expressed attitude. A comparison of standard deviations may very well reveal that computer respondents "open up" more and tend to use a slightly more extreme scale value. This may be a result of their own high level of motivation and/or the fact that they may view the computer as more "private," enabling one to answer more frankly. O'Brien & Dugdale (1977) in their computer versus interviewer study emphasize this privacy factor when they note that even

with a written questionnaire social interaction and the embarrassment that may be inherent in this is unavoidable. Information imparted to a computer, however, appears to be "whisked away," with the assumption tending to be made (in fact validly) that others cannot inspect it.

Third, survey researchers should be cautious in assuming the validity of historical information provided by students, regardless of method of survey delivery. Two factors in this study indicate that students from both groups provided invalid historical data: computer group members provided input about their initial entry date into the University that was significantly different from University records, and scanner group members overestimated their freshman year GPA compared to University records. The other background questions were also validated and proved similar to University records.

Fourth, based on respondent evaluations of the experiment, students in both groups may view the survey as convenient while also disagreeing about survey length and whether they would recommend the survey to a friend. Interestingly, no one in the computer group thought the survey long, while 86% thought it was too short. In the scanner group, the same percentage thought the survey was about the right length. Nevertheless, scanner evaluators were less likely to recommend the experiment to a friend than computer evaluators.

While response rates for the computer group were considerably attenuated in this evaluation of a new technology, and marketing strategies are obviously needed to bolster student participation, it should be noted that computer based research activities are best received when they are voluntary. Johnson & Morris (1980) concluded that students will master computer skills more easily and react more positively toward computer based research activities when they are given the option of whether to participate in such activities. Beyond response rates, results of this experiment suggest that computer administration of surveys is a

viable means of capturing information related to student opinions (e.g., overall satisfaction). However, caution should be exercised when including background questions that require recall of information (e.g., entry date and GPA). That computer group members gave more reliable answers to the question of GPA than did survey group members might be accounted for by three possibilities: (1) computer group members had a higher percentage of respondents with computer experience than did scanner members and therefore may have not only taken the survey more seriously but also possessed favorable attitudes toward computers; (2) the artificiality of the experimental setting may have had a reactive effect causing the student to be more aware that they were participating in an experiment and therefore eliciting a genuine response; and (3) computer questions were presented singularly as a separate unit allowing the student to focus on items one at a time and therefore may have served as a stimulus characteristic.

The fact that mostly those with previous computer experience responded to the computer survey, thought the survey was too short, and would recommend it to a friend has several implications for survey administrators. In sampling, it is suggested that those without previous computer experience be identified and over sampled. Furthermore, a high response rate might be achieved by setting up multiple computer stations on campus and extending the survey period. Survey length was deemed too short for the computer group. This was interesting since the scanner survey contained identical questions. Thus, more questions can be added to a computer survey without sacrificing convenience to the student. And, since computer users would recommend the survey to a friend, ask them to do so and provide an incentive.

Finally, in terms of ease of programming and processing data, the computer survey was clearly superior. For scanner surveys, not only do forms have to be developed and programs resolved, but scanner sheets must be processed and

uploaded to a readable file. All of this is somewhat faster than processing a more conventional paper survey, but is laboriously slow when compared to a computer survey. With a computer survey there is virtually no time delay between data collection and data analysis. The only major drawback to the widespread use of the DAL package used in this study is the need to use graphic terminals such as the Digital VT240 or the VT241 (color). For computer surveys in general, the only other disadvantage is the restriction to using multiple choice items only.

In closing, the present study not only underscores the importance of experimenting with nontraditional forms of survey administration, such as computers, but also serves to encourage students to become more computer oriented. Such a man-machine interaction survey experience is crucial in a day and time when some degree of competence in computer use and data analysis is necessary to avoid a new form of functional illiteracy.

REFERENCES

Campbell, D. T. & Stanley, J. C. (1963). Experimental and Quasi-experimental designs for research. Chicago: Rand McNally.

Feild, H., Holley, W., & Armenakis, A. (1978). Computerized Answer Sheets: What effects our response to a mail survey? Education and Psychological Measurement, 38, 755-759.

Hedl, J. (1971, Feb.). Computer-based intelligence testing. Paper presented at the Annual Meeting of the American Educational Research Association, New York.

Hesseldenz, J., & Smith, B. (1977). Computer-prepared questionnaires and group theories: considerations for mail surveys in academic settings. Research in Higher Education, 6, 85-94.

Johnson, W., & Morris, D. (1980, Nov.). The effects of computer oriented student research. Paper presented at the annual meeting of the CUFA session at the National Council for Social Studies, New Orleans.

Lucas, R. W. (1977). A study of patients' attitudes to computer interrogation. International Journal of Man-Machine Studies, 9, 69-86.

O'Brien, T., & Dugdale, V. (1978, Oct.). Questionnaire administration by computer. Journal of Market Research Society, 20, 228-237.

Powell, G. D. (1984, Apr.). The use of mark-sense readers in evaluation. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans.

APPENDIX

BEST COPY AVAILABLE

STUDENT OPINION SURVEY

PLACE SID BELOW

X

PLEASE HELP US BETTER UNDERSTAND YOUR EXPERIENCES AT UNCW BY COMPLETING THE BACKGROUND SECTION ON THE LEFT AND OPINION ITEMS ON BOTH SIDES. PLEASE ANSWER ALL ITEMS IN PENCIL ONLY. AS USUAL, THIS SURVEY IS STRICTLY CONFIDENTIAL. THANK YOU!

INDICATE YOUR LEVEL OF AGREEMENT WITH EACH STATEMENT ABOUT THIS COLLEGE

STRONGLY AGREE
AGREE
NEUTRAL
DISAGREE
STRONGLY DISAGREE

RACE B W O

SEX M F

FULL-TIME STUDENT N Y

FALL SEM 1984 WAS MY FIRST AT UNCW N Y

NOW LIVE ON CAMPUS N Y

NOW LIVE WITH PARENTS N Y

EITHER PARENT HAS A DEGREE N Y

I WORK ON CAMPUS N Y

I WORK OFF CAMPUS N Y

I WORK < 20 HRS/WK N Y

HIGHEST DEGREE PLANNED

ASSOCIATES
BACHELOR'S
MASTER'S
BEYOND MASTER'S

PLAN TO REENROLL THIS SPRING N Y

MY FRESHMAN YEAR GPA WAS

< 1.5
1.5-1.9
2.0-2.4
2.5-2.9
≥ 3.0

		COMPUTER	SCANNER
Generally, I am very satisfied with my overall experience at UNCW.	$\bar{X}$	3.81	3.87
	SD	0.98	0.68
Since coming to this university, I have developed close personal relationships with other students.	$\bar{X}$	3.81	4.10
	SD	1.28	0.88
The student friendships I have developed at the university have been personally satisfying.	$\bar{X}$	4.08	4.25
	SD	0.97	0.70
My non-classroom interactions with faculty have had a positive influence on my personal growth, values, and attitudes.	$\bar{X}$	3.47	3.48
	SD	0.91	0.79
My non-classroom interactions with faculty have had a positive influence on my career goals and aspirations.	$\bar{X}$	3.58	3.42
	SD	0.73	0.79
Most of the faculty members I have had contact with are genuinely interested in students.	$\bar{X}$	3.67	3.90
	SD	0.99	0.66
Most of the faculty members I have had contact with are genuinely outstanding or superior teachers.	$\bar{X}$	3.44	3.40
	SD	0.77	0.76
My academic experience has had a positive influence on my intellectual growth and interest in ideas.	$\bar{X}$	3.94	4.00
	SD	0.96	0.62
I am satisfied with the extent of my intellectual development since enrolling at UNCW.	$\bar{X}$	3.69	3.57
	SD	0.79	0.85
I am confident that I made the right decision in choosing to attend this university.	$\bar{X}$	3.97	3.95
	SD	0.85	0.95
It is important for me to graduate from college.	$\bar{X}$	4.72	4.83
	SD	0.78	0.49
It is important for me to graduate from UNCW.	$\bar{X}$	3.11	3.78
	SD	0.82	1.20

PLEASE CONTINUE

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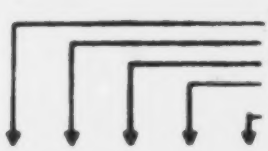
I have had contacts with faculty outside of the classroom for 10 minutes or more:



I have had no outside contact with faculty members.
To socialize informally.
To discuss intellectual or course-related matters.
To get basic information and advice about my academic career.
To discuss a campus issue or problem.

DO NOT WRITE IN THIS AREA

You can help us evaluate this optically-scanned survey by answering just a few more questions:

Have you ever been exposed to computers?

- N
- Y

How inconvenient has this survey been?

- Very inconvenient
- Somewhat inconvenient
- Not inconvenient

Compared to a regular paper survey, would you recommend an optically-scanned survey like this one to a friend?

- N
- Y

What would you say about the survey length?

- Too long
- Too short
- About the right length

PLEASE ENTER THE CODE FOR YOUR ACADEMIC CLASS FROM THE FOLLOWING LIST

- New Freshman
- Continuing Freshman
- Sophomore
- Junior
- Senior

We would like to extend our appreciation to you for taking the time to complete this survey.

The University of North Carolina at Wilmington is committed to equality of educational opportunity and does not discriminate against applicants, students or employees based on race, color, national origin, religion, sex, age or handicap. Moreover, The University of North Carolina at Wilmington is open to people of all races and actively seeks to promote racial integration by recruiting and enrolling a larger number of black students.

BEST COPY AVAILABLE

TABLE 1

QUESTIONNAIRE RETURNS BY DEMOGRAPHICS

	[a] COMPUTER	[b] SCANNER	CHI-SQUARE	p
RACE			4.53	0.1
BLACK	0	3		
WHITE	36	53		
OTHER	0	4		
SEX			0.01	0.91
MALE	15	23		
FEMALE	21	37		
GPA GROUP			2.41	0.66
BELOW 1.5	0	1		
1.5 TO 1.9	5	12		
2.0 TO 2.4	15	22		
2.5 TO 2.9	11	13		
ABOVE 2.9	5	12		
STATUS			0.07	0.79
PART-TIME	1	0		
FULL-TIME	35	60		
RESIDENCY			0.07	0.79
OFF-CAMPUS	14	25		
ON-CAMPUS	22	35		
ENTRY DATE			0.14	0.71
NOT FALL 84	0	2		
FALL 84	36	58		
	a	b		
	29% response rate	49% response rate		

TABLE 2

COMPARISON OF SELF AND UNIVERSITY RECORDED DEMOGRAPHICS

BACKGROUND		SELF-REPORT		UNIVERSITY RECORDS		
ITEM	GROUP	M	SD	M	SD	t
RACE						
	COMPUTER	2	0	2	0	0
	SCANNER	1.97	0.29	2	0.34	-1.43
SEX						
	COMPUTER	1.52	0.51	1.58	0.5	-1.43
	SCANNER	1.61	0.49	1.61	0.49	0
STATUS						
	COMPUTER	1.94	0.23	1.97	0.17	-0.57
	SCANNER	1.95	0.22	2	0	-1.76
ENTRY DATE						
	COMPUTER	1.67	0.48	2	0	-4.18*
	SCANNER	1.88	0.32	1.96	0.18	-1.93
RESIDENCY						
	COMPUTER	1.58	0.5	1.61	0.49	-1
	SCANNER	1.58	0.5	1.58	0.5	0
GPA GROUP						
	COMPUTER	3.42	0.97	3.44	0.91	-0.25
	SCANNER	3.75	0.92	3.41	1.08	4.79*

NOTE.-Means for each variable are based on the following scheme. * p < .01

RACE: 1=BLACK; 2=WHITE; 3=OTHER

SEX: 1=MALE; 2=FEMALE

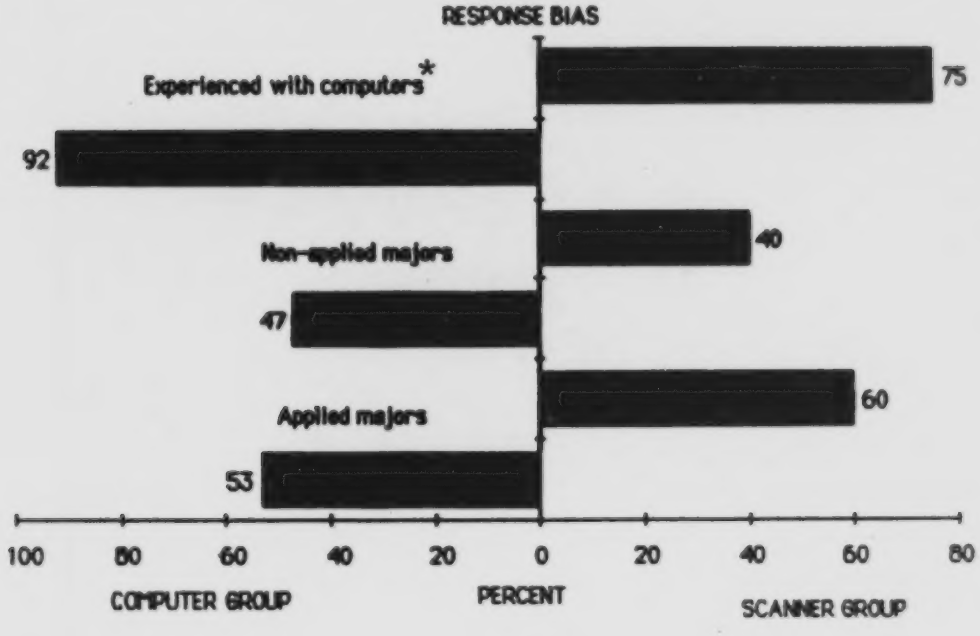
STATUS: 1=PART-TIME; 2=FULL-TIME

ENTRY DATE: 1=NOT FALL 84; 2=FALL 84

RESIDENCY: 1=LIVE OFF CAMPUS; 2=LIVE ON CAMPUS

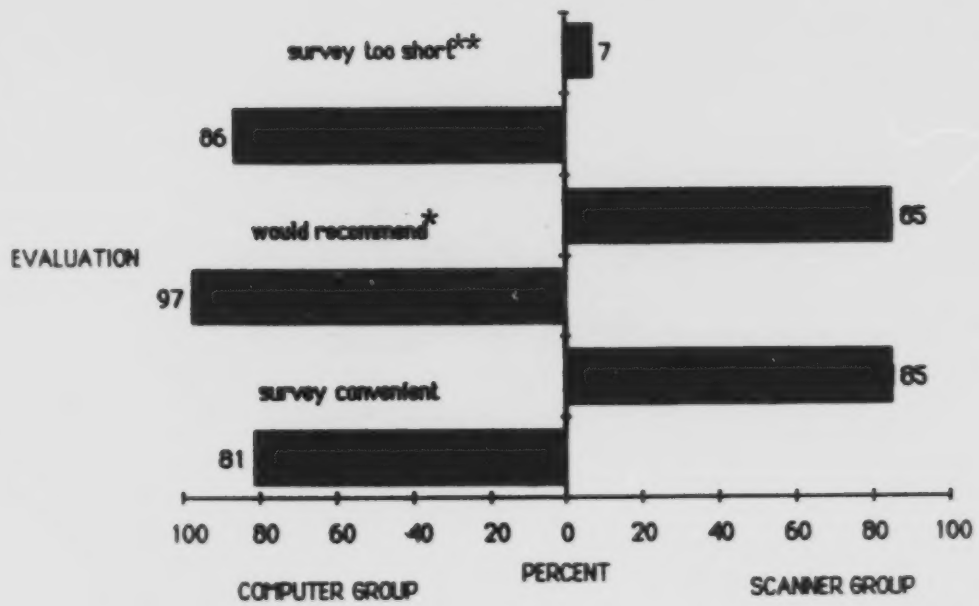
GPA GROUP: 1=BELOW 1.5; 2=1.5 TO 1.9; 3=2.0 TO 2.4; 4=2.5 TO 2.9; 5=ABOVE 2.9

FIGURE 1


RESPONSE BIAS
Experienced with computers*
92
75
Non-applied majors
47
40
Applied majors
53
60
100
80
60
40
20
0
20
40
60
80
COMPUTER GROUP
PERCENT
SCANNER GROUP

*p<.05

FIGURE 2
RESPONDENT EVALUATION



*p<.05

**p<.01

FROM: David F. Allen (ext 3735)
Student Affairs
10/29/85

SPECIAL INSTRUCTION:
Run thru Nov 18

SEAHAWK AD

SURVEY!!!

Win prizes by putting your opinions to work! We are offering you free refreshments from the Snack Bar and a chance at one of two $25 cash prizes--just for letting us know what you think about UNCW so far. Imagine that! Be on the look-out for this STUDENT OPINION SURVEY in the coming days! Good luck!

Sponsored by: Division of Student Affairs & the Office of Institutional Research

THE UNIVERSITY OF NORTH CAROLINA
AT WILMINGTON

VICE CHANCELLOR FOR STUDENT AFFAIRS
601 SOUTH COLLEGE ROAD
WILMINGTON, NORTH CAROLINA 28403-3297
919 395-3117

November 18, 1985

Dear Student:

Congratulations! This letter identifies you as one of the 250 students randomly selected to participate in our **Student Opinion Survey** that was announced in the Seahawk recently. Your participation is completely voluntary and your responses absolutely confidential. The study is designed to help us understand your experiences at UNCW and improve our services for not only you but future generations of students as well.

We value your input so much that we are offering you multiple incentives for helping us. Besides a free soda and popcorn, we are offering you a chance at one of two $25 cash awards. The cash drawing will be held Friday, December 13, at 4:30 p.m. The winner will be immediately contacted by phone and announced in the Seahawk.

Please take five minutes of your time now to complete this survey. If you have additional questions regarding this study, please feel free to contact the study coordinator, Dr. David Allen, at 395-3735. He will be happy to answer your questions.

We appreciate your time and look forward to your participation in this research effort.

Sincerely,

William A. Bryan

William A. Bryan
Vice Chancellor for Student Affairs

P.S. After completing the survey with the No. 2 pencil provided, please drop the survey in the box next to the post offfice (you may keep the pencil). To collect on your free soda and popcorn, just take this cover letter with you through the check-out line in the Snack Bar. This offer expires Thursday, December 19, 1985.

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We value your input so much that we are offering you multiple incentives for helping us. Besides a free soda and popcorn, we are offering you a chance at one of two $25 cash awards. The cash drawing will be held Friday, December 13, at 4:30 p.m. The winner will be immediately contacted by phone and announced in the Seahawk.

To participate in this brief five minute survey please bring this cover letter with you between 11:00 a.m. and 3:00 p.m., Monday through Friday, to Room 100 of the Union. A consultant will meet you there and introduce you to the study. If you have additional questions regarding this study, please feel free to contact the study coordinator, Dr. David Allen, at 395-3735. He will be happy to answer your questions.

We appreciate your time and look forward to your participation in this research effort.

Sincerely,

William A Bryan

William A. Bryan
Vice Chancellor for Student Affairs

P.S. After you complete the survey, the consultant in Room 100 will stamp your cover letter. You will need the stamped cover letter to receive your free drink and popcorn. This offer expires Thursday, December 19, 1985.

THE UNIVERSITY OF NORTH CAROLINA
AT WILMINGTON

VICE CHANCELLOR FOR STUDENT AFFAIRS
601 SOUTH COLLEGE ROAD
WILMINGTON, NORTH CAROLINA 28403-3297
919-395-3117

November 22, 1985

Dear Student:

Concerning the Student Opinion Survey — we've moved! For your convenience, we've moved near the student mail boxes. We are now just a few steps from you next to the Career Planning and Placement Center. Our hours are 11 a.m. to 3 p.m., Monday through Friday, until December 8.

For most, the survey takes about two minutes to complete. We want to know what you think of UNCW so far. Your answers are completely confidential.

Please help us with this research effort. We plan to stop the survey after December 8. You are one of a select few randomly chosen for this study. You may use this cover letter to retrieve one medium size soda and popcorn until the end of the semester.

Our offer of two $25 cash awards still holds. So far, your chances of being selected are extremely high since so few have responded to the survey.

We thank you for taking the two minutes to share your opinions with us. A consultant will guide you through the survey any time between 11 p.m. and 3 p.m., Monday through Friday. Have a great Thanksgiving holiday!

Sincerely,

William A. Bryan

William A. Bryan
Vice Chancellor for Student Affairs

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THE UNIVERSITY OF NORTH CAROLINA
AT WILMINGTON

VICE CHANCELLOR FOR STUDENT AFFAIRS
601 SOUTH COLLEGE ROAD
WILMINGTON, NORTH CAROLINA 28403-3297
919/395-3117

December 2, 1985

Dear Student:

We need your help on our Student Opinion Survey! Sometime between 11 a.m. and 5 p.m. this week, please dedicate just two minutes of your time to visit our station next to the Placement Center and complete our simple, computerized survey. No computer experience is needed!

With only one in five students responding so far, your two chances of winning $25 in cash are extremely high. At any rate, what easier way could you also receive a free drink and popcorn from the snack bar?

We provide these incentives because we realize your time is precious. Your opinions about your academic and social experiences are just as important to us. Without them, we simply could not improve our services.

Finally, you are one of 125 randomly selected students chosen to represent your class and complete a computerized survey. Given this low figure, every survey counts heavily! You can be sure that your responses will be taken seriously to help make UNCW a better place for all. Thank you for your help. Good luck on exams!

Sincerely,

William A. Bryan
Vice Chancellor for Student Affairs

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THE UNIVERSITY OF NORTH CAROLINA
AT WILMINGTON

VICE CHANCELLOR FOR STUDENT AFFAIRS
601 SOUTH COLLEGE ROAD
WILMINGTON, NORTH CAROLINA 28403-3297
919/395-3117

December 2, 1985

Dear Student:

We need your help on our Student Opinion Survey! With the #2 pencil provided, please take just two minutes now to complete it and drop it in the box next to the post office.

With only one in five students responding, your two chances of winning $25 in cash are extremely high. At any rate, what easier way could you also receive a free drink and popcorn from the snack bar?

We provide these incentives because we realize your time is precious. Your opinions about your academic and social experiences are just as important to us. Without them, we simply could not effectively improve our services.

Finally, you are one of 125 randomly selected students chosen to represent your class and complete the enclosed optically scanned survey. Given this low figure, every survey counts heavily! You can be sure that your responses will be taken seriously to help make UNCW a better place for all. Thank you for your help. Good luck on exams!

Sincerely,

William A. Bryan

William A. Bryan
Vice Chancellor for Student Affairs

tle

THE UNIVERSITY OF NORTH CAROLINA
AT WILMINGTON

VICE CHANCELLOR FOR STUDENT AFFAIRS
601 SOUTH COLLEGE ROAD
WILMINGTON, NORTH CAROLINA 28403-3297
919 395-3117

November 18, 1985

TO: Brent Winner, 799-8782
Eric Oates, 395-5246
Dean Bunn, 392-6267

FROM: Dave Allen DA

RE: Computed Assisted Survey

The following is provided to facilitate our administration of this experiment. If you have questions, please call either myself (3735) or Bob Fry (3523). We appreciate your assistance.

Schedules

First of all, the experiment is scheduled to run from November 18 through December 6 (minus holidays) with a possible extension through December 13. Work stations are to be manned from 11 a.m. to 3 p.m. daily during this period. Your work schedules are as follows:

Name	Dates
Brent	November 18, 20, 22 December 2, 4, 6
Eric	November 19, 21, 25, 27
Dean	November 26 December 3, 5

Set-up

Next, you will be stationed just under the stairwell in front of Room 100 in the Union. Both computers will be secured in the backroom of Room 100. Pick up and return all keys from Room 214 in the Union (Steve Gnadt). In addition, you will need a long table. It too is in the storeroom of Room 100.

Equipment

At your station, you should have the following equipment on hand:

1. 2 computers and cord
2. 1 table
3. Roster of survey students
4. Extra cover letters, op-scan surveys and pencils
5. Stamp and red stamp pad

Check-in

Check in each eligible student by comparing their ID with your roster marked "consultant copy." Log them in under the column marked "Date/Time." Be sure that only those with the number "1" marked beside their name on the roster are the ones you allow to do the computer experiment.

administer the Survey

Once checked in, log onto the system by using the following sequence:

1. Switch on terminal (in back)
2. Type "VXA" when you see the "Select Service"
3. Hit "return" once or twice until you see "username"
4. Type "Survey" and return
5. Type "Lillyput"
6. Type "01" when you see "Enter a number"
7. Type "Y" when you see "Another Survey?"
   (Type "N" if you want to log off)
8. Explain to the student that all they need to do is respond by typing a number or letter (i.e., they don't need to hit "return")
9. Once finished, type "Y" if another student is waiting or you want to leave the system on. (You will be logged off after 20 minutes of inactivity.) Just log back on from scratch if you get knocked off the system.
10. Stamp the student's cover letter in red after they complete the survey. Tell them it is now good for a drink and popcorn in the Snack Bar.
11. For those students who show up and have a number "2" by their name, offer them one of your optically-scanned surveys, cover letter and pencil; ask them to leave it with you or drop it off in the box by the Post Office when they complete it. Stamp their cover letter also.
12. At the end of the day (3 p.m.), return all equipment to where you picked it up in Room 100. Lock it up and return the key.

Cardinal Rule

Do not leave the computers unattended. Even to use the bathroom, ask someone at the Information Center to watch them until you return.

Thanks and Good Luck!